From:	Suplee, Mike
To:	Laidlaw, Tina
Subject:	Wisconsin stuff
Date:	Monday, December 09, 2013 10:24:26 AM
Attachments:	nr217.pdf WI P rule review.pdf

Hi Tina;

The law in Wisconsin that keeps being brought back up is in NR217, page 150 top of right hand column ((1.) You'll see it. I have also attached the rule summary which is a flow chart.

Chapter NR 217

EFFLUENT STANDARDS AND LIMITATIONS FOR PHOSPHORUS

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Note: Effluent standards are being created for phosphorus at this time. Effluent standards for other pollutants may be added to this chapter at later dates.

Note: Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, August, 1997, No. 500.

Subchapter I — General

NR 217.01 Purpose. The purpose of this chapter is to reduce the amount of phosphorus discharged to surface waters by establishing effluent standards and limitations, including water quality based effluent limitations, for phosphorus in effluent discharged to surface waters of the state. Effluent standards and limitations are developed pursuant to ch. 283, Stats.

History: Cr. Register, November, 1992, No. 443, eff. 12−1−92; **CR 10−035: am. Register November 2010 No. 659, eff. 12−1−10.**

Subchapter II — Phosphorus Effluent Standards and Limitations

NR 217.02 Applicability. This subchapter is applicable to point sources which discharge phosphorus to the surface waters of the state.

History: Cr. Register, November, 1992, No. 443, eff. 12−1−92; **CR 10−035: am. Register November 2010 No. 659, eff. 12−1−10.**

NR 217.03 Definitions. Definitions of terms and the meaning of abbreviations used in this subchapter are as defined in ss. NR 102.03, 106.03, 205.03, 210.03, and 243.03. In addition: "effluent standard" means any requirement for phosphorus established pursuant to s. 283.11 (3), Stats., and this subchapter.

History: Cr. Register, November, 1992, No. 443, eff. 12−1−92; **CR 10−035: am. Register November 2010 No. 659, eff. 12−1−10.**

NR 217.04 Effluent standards and limitations for phosphorus. (1) GENERAL. Effluent limitations for total phosphorus shall be imposed in WPDES permits for wastewaters discharged to surface waters as specified in this section.

(a) An effluent standard for total phosphorus shall apply as follows:

1. An effluent limitation equal to 1 mg/L total phosphorus as a monthly average shall apply to publicly owned treatment works and privately owned domestic sewage works subject to ch. NR 210 which discharge wastewater containing more than 150 pounds of total phosphorus per month, unless an alternative limitation is provided under sub. (2).

2. An effluent limitation equal to 1 mg/L total phosphorus as a monthly average shall apply in cases where the discharge of wastewater from all outfalls of a facility other than those subject to ch. NR 210 contains a cumulative total of more than 60 pounds of total phosphorus per month, unless an alternative limitation is provided under sub. (2). Outfalls consisting of noncontact cooling water without phosphorus containing additives may not be included in the calculation of the cumulative total of phosphorus discharged from the facility. Compliance with the concentration limit shall be determined as a rolling 12 month average as determined by the total phosphorus from all outfalls subject to the effluent limitation for the most recent 12 months divided by the total flow for all those outfalls for the same period.

3. Effluent limitations for phosphorus equal to 1 mg/L as a monthly average contained in permits on December 1, 1992 shall remain in effect.

4. Effluent limitations for phosphorus equal to 85% removal of influent concentrations of phosphorus contained in permits on December 1, 1992 shall be modified to 1 mg/L total phosphorus as a monthly average upon reissuance of the permit unless an alternative limitation is provided under sub. (2).

5. Runoff to surface waters from animal feeding operations shall be controlled using best management practices to achieve the purpose of this chapter pertaining to phosphorus.

6. The department shall determine if a permittee is discharging more than the applicable threshold value specified in subd. 1. or 2. by examining available data on or requiring monitoring of the amount of phosphorus contained in the wastewater effluent. Such data shall be representative of the amount of phosphorus contained in the wastewater effluent during periods of discharge or operation.

Note: The threshold values of this section will be applied at the time of WPDES permit reissuance or permit modification which may occur due to changes in waste characteristics.

Note: See NR 102.06 in reference to water quality standards.

(2) ALTERNATIVE EFFLUENT LIMITATIONS TO THE EFFLUENT STANDARD FOR PHOSPHORUS. (a) Permittees subject to sub. (1) (a) 1., 2., or 4. may request an alternative effluent limitation for total phosphorus if one or more of the following apply:

1. A permittee may request an alternative effluent limitation in cases where achieving the 1 mg/L total phosphorus effluent standard is not practically achievable.

a. A permittee requesting an alternative effluent limitation under this subdivision shall provide, as a part of the WPDES permit process, information which demonstrates that the 1 mg/L total phosphorus effluent standard is not practically achievable and information necessary for the department to establish an alternative effluent limitation. The information provided shall include but not be limited to the following: the results of a comprehensive phosphorus minimization study to determine the sources of phosphorus to the wastewater, an evaluation of possible methods to reduce the sources of phosphorus to the wastewater, a description of actions implemented to reduce the sources of phosphorus to the wastewater. In addition, the permittee shall provide data on the phosphorus concentrations in the influent to and effluent from the wastewater treatment facilities which are achievable after phosphorus minimization steps have been implemented, alternative treatment technologies which may be employed to achieve the 1 mg/L effluent standard, and their associated removal efficiencies and costs and the requested alternative effluent limitation.

b. The department shall review requests and the information provided by permittees and may establish alternative effluent limitations to the effluent standard imposed under sub. (1) (a) 1., 2. or 4. where this standard, in the best professional judgment of the department, is not practically achievable. For these cases, the department shall establish an alternative effluent limitation considering the effluent quality achievable with the application of treatment technologies, process changes, and phosphorus minimization steps to reduce the amount of phosphorus to the maximum extent practically achievable taking into account energy, economic and environmental impacts.

2. A permittee may request an alternative effluent limitation in cases where the operation of specific biological phosphorus removal technologies will achieve a level of performance equivalent to a 1 mg/L effluent standard. Systems which employ biological phosphorus removal technology shall result in the removal of not less than 90% of the phosphorus which would be removed by achieving the 1 mg/L total phosphorus effluent standard based upon a mass determination.

a. A permittee requesting an alternative effluent limitation under this subdivision shall, as a part of the WPDES permit application process, provide information which demonstrates that achieving the requested alternative effluent limitation using biological phosphorus removal will achieve this requirement. The information shall include data on the total mass of phosphorus discharged using biological removal with and without chemical polishing and the total mass of phosphorus discharged using treatment technologies to achieve the 1 mg/L effluent standard and the information necessary for the department to establish an alternative effluent limitation.

b. The department shall review requests and the information provided by permittees and may establish alternative effluent limitations to the effluent standard imposed under sub. (1) (a) 1., 2., or 4. where the alternative limitation, in the best professional judgment of the department, will result in insignificant differences in the amount of phosphorus discharged, on a mass basis, compared to the mass which would be discharged by achieving the 1 mg/L total phosphorus effluent standard. For these cases, the department shall establish an alternative effluent limitation considering the effluent quality achievable with the application of biological phosphorus removal technologies, taking into account the total phosphorus removal performance on a mass basis. The alternative effluent limitation established by the department under this subparagraph may not exceed 2 mg/L as a monthly average.

3. A permittee may request an alternative effluent limitation in cases where phosphorus−deficient wastewaters necessitate the addition of phosphorus to a biological treatment system to assure efficient operation and compliance with other effluent limitations.

a. A permittee requesting an alternative effluent limitation under this subdivision shall, as a part of the WPDES application process, provide information which demonstrates that achieving the 1 mg/L total phosphorus effluent standard is not practically achievable and the information necessary for the department to establish an alternative effluent limitation. The information provided shall include but not be limited to the following: the results of a comprehensive phosphorus minimization study to minimize the amount of phosphorus discharged while allowing efficient operation of the wastewater treatment system, a description of actions implemented to reduce the amount of phosphorus discharged, the phosphorus effluent concentrations achievable after phosphorus minimization steps have been implemented, the removal efficiencies and costs associated with alternative treatment technologies which would be necessary to achieve the 1 mg/L effluent standard and the requested alternative limitation.

b. The department shall review requests and the information provided by the permittee and may establish alternative effluent limitations to the effluent standard imposed under sub. (1) (a) 2. where this standard, in the best professional judgment of the department, is not practically achievable. The department shall establish an alternative effluent limitation considering the minimum phosphorus effluent quality achievable while allowing efficient operation of the wastewater treatment system. The alternative effluent limitation established by the department under this subdivision may not exceed 2 mg/L as a monthly average.

(b) Permittees subject to sub. (1) (a) 1. or 2. which do not discharge their effluent into the basins of the Great Lakes or the Fox (Illinois) river may request an alternative effluent limitation for total phosphorus according to the provision of this paragraph.

1. A permittee may request an alternative effluent limitation under this paragraph in cases where achieving the 1 mg/L effluent standard would not result in an environmentally significant improvement in water quality and material progress towards the attainment and maintenance of associated surface water quality standards for the receiving water as established in chs. NR 102 to 104.

2. A permittee requesting an alternative effluent limitation under this paragraph shall propose for the department's approval a study plan to identify the receiving waters affected or potentially affected by the discharge, describe how information will be obtained to justify an alternative effluent limitation under this paragraph, and provide the information necessary to establish interim and alternative effluent limitations under this paragraph. This study plan shall be submitted as a part of the WPDES permit application process. The results of the study shall include an evaluation of all point and non−point sources of phosphorus in the watersheds and the impacts of the phosphorus contributions on biological and chemical water quality conditions. Upon review of the study plan, the department may require additional information as deemed necessary and may expand the study to include other watersheds or portions thereof that may be significantly impacted by the permittee's discharge of phosphorus.

3. The department may establish an alternative effluent limitation where, in the best professional judgment of the department and based upon the information provided by the permittee pursuant to the study plan and other relevant information, achieving the effluent standard under sub. (1) (a) 1. or 2. would not result in an environmentally significant improvement in water quality and material progress towards the attainment of associated surface water quality standards for the receiving waterbody as established in chs. NR 102 to 104.

4. An interim effluent limitation and compliance schedule for completing the study shall be imposed in a permit until the request for an exemption from the 1 mg/L effluent standard is approved or denied. The interim effluent limitation shall be equal to the representative concentration of total phosphorus as a monthly average in the effluent based on the information provided by the permittee as a part of the WPDES permit application process.

5. Alternative effluent limitations established under this paragraph may not exceed the interim effluent limitation established under subd. 4.

(3) ANALYTICAL METHODS AND LABORATORY PROCEDURES. Methods used for analysis of influent and effluent samples shall be as described in ch. NR 219 unless alternative methods are specified in the WPDES discharge permit.

(4) COMPLIANCE. The department shall determine and specify a reasonable compliance schedule in the permittee's WPDES permit if the facility is unable to meet the effluent standard or limitations determined according to this section at the time of permit issuance or reissuance. The date for compliance with this section may not extend beyond 3 years from the date of permit issuance or reissuance, unless the department determines that circumstances beyond the permittee's control, such as an environmental impact statement, require additional time for compliance. In such circumstances, the date for compliance with this section may not

extend beyond 5 years from the date of permit issuance or reissuance.

(5) DEPARTMENT DETERMINATIONS. Effluent standards and limitations established under subs. (1) (a) and (2) are not subject to the variance procedure under s. 283.15, Stats.

History: Cr. Register, November, 1992, No. 443, eff. 12−1−92.

Subchapter III — Water Quality Based Effluent Limitations for Phosphorus

NR 217.10 Applicability. This subchapter applies to discharges of phosphorus to surface waters of the state from the following point sources:

(1) Publicly and privately owned wastewater facilities or treatment works;

(2) Noncontact cooling water discharges which contain phosphorus unless 100 percent of the phosphorus in the discharge originates from the receiving water as intake water;

(3) Concentrated animal feeding operations that discharge manure or process wastewater from the production area through alternative treatment facilities under s. NR 243.13; and

(4) A facility or site that is regulated under ch. NR 216 only where the department has determined that compliance with the standards in chs. NR 151 and 216 are not sufficient to meet phosphorus criteria in s. NR 102.06.

Note: There may be other point sources that are not subject to the procedures in this subchapter, but which are be subject to s. 283.13 (5), Stats., or procedures in other rules (e.g., ch. NR 243 requirements for concentrated animal feeding operations).

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.11 Definitions. Definitions of terms and the meaning of abbreviations used in this subchapter are as defined in ss. NR 102.03, 106.03, 205.03, 210.03, and 243.03. In addition, for purposes of this subchapter, the following definitions apply:

(1) "303 (d) list" means a list of waters established by the department and approved by US EPA pursuant to 33 USC 1313 (d) (1) (A) and 40 CFR 130.7.

(2) "Adaptive management" means the use of monitoring data and other information at the time of permit reissuance to reassess management decisions and permit requirements.

(3) "New discharger" means a point source which was not authorized by a WPDES permit as of December 1, 2010. A new discharger includes a relocation of an outfall to a different receiving water.

(4) "Phosphorus impaired water" means a surface water listed on the 303 (d) list that is impaired for phosphorus, nutrients, or diurnal swings of dissolved oxygen.

Note: A surface water may be impaired and placed on the 303 (d) list for a reason other than phosphorus, nutrients, or dissolved oxygen (e.g., mercury), however the procedures in this subchapter only apply to impairments related to phosphorus, nutrients, or diurnal swings of dissolved oxygen.

(5) "Privately owned wastewater facilities or treatment works" means a facility or treatment works owned by a nongovernmental entity that discharges domestic wastewater, commercial wastewater, or industrial wastewater or a combination thereof.

(6) "Technology based limitation" means an effluent limitation for phosphorus established pursuant to s. 283.11 (3), Stats., and subch. II or s. 283.13 (2) or (4), Stats.

(7) "Total maximum daily load" or "TMDL" means the amount of pollutants specified as a function of one or more water quality parameters that can be discharged into a water quality limited segment and still ensure attainment of the applicable water quality standard in a watershed.

(8) "US EPA" means the United States Environmental Protection Agency.

(9) "WQBEL" means a water quality based effluent limitation.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.12 General. (1) Water quality based effluent limitations for phosphorus shall be included in a permit whenever the department determines:

(a) The discharge from a point source contains phosphorus at concentrations or loadings which will cause, has the reasonable potential to cause or contribute to an exceedance of the criteria in s. NR 102.06 in either the receiving water or downstream waters; and

(b) The technology based effluent limitation or the alternative treatment technology limitation calculated under s. NR 243.13 is less stringent than necessary to achieve the applicable water quality standard for phosphorus in s. NR 102.06.

(2) If the technology based limitation expressed as a concentration is more stringent than the water quality based effluent limitation expressed as a concentration under s. NR 217.13, then the technology based limit shall be included in the permit, along with any mass limitations calculated under this subchapter as required under s. NR 217.14 (1) and (3).

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.13 Calculation of water quality based effluent limitations for phosphorus. (1) BASIS FOR LIMITATIONS. (a) The department shall calculate potential water quality based effluent limitations for point source dischargers of phosphorus using the procedures in this section.

(b) Water quality based effluent limitations for phosphorus shall be calculated based on the applicable phosphorus criteria in s. NR 102.06 at the point of discharge, except the department may calculate the limitation to protect downstream waters.

(2) DISCHARGES TO STREAMS AND RIVERS. (a) *Limitation calculation*. For discharges of phosphorus to flowing streams and rivers, the water quality based effluent limitation shall be calculated using the following conservation of mass equation:

$$\text{Limitation} = [(WQC)\,(Qs+(1-f)Qe) - (Qs - fQ_e)\,(Cs)]/Qe$$

Where:

Limitation = Water quality based effluent limitation (in units of mass per unit of volume),

WQC = The water quality criterion concentration (in units of mass per unit volume) from s. NR 102.06,

Qs = Receiving water design flow (in units of volume per unit time) as specified in par. (b),

Qe = Effluent flow (in units of volume per unit time) as specified in par. (c),

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Upstream concentration (in units of mass per unit volume) as specified in par. (d).

(b) *Receiving water design flow (Qs).* Based on the availability of information and the professional judgment of the department, the value of Q_s to be used in calculating the effluent limitation for discharges to flowing waters shall be determined using one of the following:

1. The average minimum 7−day flow which occurs once every 2 years (7−day Q_2) based on information derived by the U. S. geological survey or other department approved information source, using data from a representative gauging station with a period of record of at least 10 years.

2. If provided by the permittee and approved by the department, the average low 30−day flow which occurs once every 3 years (30−day Q_3) based on information derived by the U. S. geological survey or other department approved information source, using data from a representative gauging station with a period of record of at least 10 years.

3. Other flow deemed more representative of flow conditions and approved by the department.

(c) *Effluent flows (Q_e).* 1. For dischargers subject to ch. NR 210 and which discharge for 24 hours per day on a year−round basis, Q_e shall equal the maximum effluent flow, expressed as a daily average, that is anticipated to occur for 12 continuous months during the design life of the treatment facility unless it is demonstrated to the department that this design flow rate is not representative of projected flows at the facility.

2. For other dischargers not subject to ch. NR 210, Q_e shall equal, based on the best professional judgment of the department, one of the following:

a. The maximum effluent flow, expressed as a 365 day rolling average of daily discharges that has occurred for 12 continuous months and represents normal operations.

b. The maximum effluent flow, expressed as a 30 day rolling average, which has occurred for 30 continuous days and represents normal operations.

3. For seasonal discharges, discharges proportional to stream flow, or other non−continuous discharge situations, Q_e shall be determined on a case by case basis.

(d) *Upstream concentrations (C_s).* The representative upstream concentration of phosphorus shall be used in specific water quality based effluent limit calculations. At a minimum, the representative upstream concentration shall be either a concentration derived by the department based on data from the specific stream or from a similar location. Where data is collected on the upstream location, the concentration used shall equal the median of at least four samples collected throughout the period of May through October. All samples collected during a 28−day period shall be considered as a single sample and the average of the concentrations used. Where data is available from more than one year in the last five years, the department may use all of the years of data in the calculation of the upstream concentration. The department may also use data older than five years provided that it is representative of current conditions. Upstream concentrations may not be measured at a location within the direct influence of a point source discharge. The determination of upstream concentrations shall be evaluated at each permit reissuance.

Note: The department has guidance on collection methods for ambient water sampling and may develop guidance for the evaluation of representative data. The guidance may be obtained from the offices of the department of natural resources, bureau of watershed management at 101 South Webster Street, P.O. Box 7921, Madison, Wisconsin 53707.

(3) DISCHARGES TO INLAND LAKES AND RESERVOIRS. For discharges of phosphorus directly to inland lakes, reservoirs, and other receiving waters which do not exhibit a unidirectional flow at the point of discharge, the department shall set the effluent limit equal to the criterion for the receiving water or the downstream water.

Note: As described in s. NR 217.16, effluent limitations for discharges to lakes may also be based on the wasteload allocation of a total maximum daily load, where the total maximum daily load has been approved by US EPA.

(4) DISCHARGES DIRECTLY TO GREAT LAKES. For discharges directly to the Great Lakes, the department shall set effluent limits consistent with nearshore or whole lake model results approved by the department. The department may set an interim effluent limit based on the best readily available phosphorus removal technology commonly used in Wisconsin.

Note: At the time this rule was promulgated, December 1, 2010, the best readily available phosphorus removal technology indicates a limit of 0.6 mg/L.

(5) OTHER METHODS OF LIMIT CALCULATION. The department may use other models and equations for calculating a water quality based effluent limitation if, in the best professional judgment of the department, the model provides a more accurate representation of the conditions.

(6) MULTIPLE DISCHARGES. (a) Except as provided in par. (b), whenever the department determines that more than one discharge may be affecting the water quality of the same receiving water, the resultant combined allowable load shall be divided among the various discharges using an allocation method based on site−specific considerations. Whenever the department makes a determination under this subsection, the department shall notify all permittees who may be affecting the water quality of the same receiving water of the determination and any limitations developed under this subsection. Permittees shall be given the opportunity to comment to the department on any determination made under this subsection.

(b) This subsection does not apply if there is a US EPA approved TMDL for phosphorus for the receiving water. If there is a US EPA approved TMDL, the combined allowable load shall be divided in accordance with the approved TMDL.

(7) MINIMUM EFFLUENT LIMITATIONS. If the water quality based effluent limitation calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06 for the water body, the effluent limit shall be set to be equal to the criterion.

(8) NEW DISCHARGERS. If a new discharger is proposing a discharge of phosphorus to a receiving or downstream water that is a phosphorus impaired water, the new discharger may not discharge phosphorus except as follows:

(a) The new discharge of phosphorus is allocated part of the reserve capacity or part of the wasteload allocation in a US EPA approved TMDL;

(b) The new discharger can demonstrate the new discharge of phosphorus will improve water quality in the phosphorus impaired segment; or

(c) The new discharger can demonstrate that the new phosphorus load will be offset through a phosphorus trade or other means with another discharge of phosphorus to the 303 (d) listed water. The offset must be approved by the department and must be implemented prior to discharge.

Note: Section 283.84, Stats., establishes requirements for pollutant trades.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.14 Expression of limitations. (1) GENERAL. (a) Water quality based effluent limitations, when required pursuant to s. NR 217.15, shall be expressed in a discharge permit as a concentration. A mass limit shall also be included in a permit for discharges of phosphorus to any of the following receiving or downstream waters:

1. A lake or reservoir;

2. An outstanding or exceptional resource water, as designated in ss. NR 102.10 and 102.11;

3. A phosphorus impaired water; or

4. A surface water that has an approved TMDL for phosphorus.

(b) The department may establish mass limitations in permits for any other discharges of phosphorus if a concentration limit for phosphorus is included in the permit, and where an increase in phosphorus load is likely to result in adverse effects on water quality in the receiving water or downstream water.

(c) For discharges to lakes, the department shall also include an annual mass limit for phosphorus in the permit.

(d) If there is a US EPA approved TMDL for the receiving water, the department shall include a mass limit expressed in the manner consistent with the requirements of the TMDL. As provided in s. NR 217.16, this TMDL based mass limit may be included in the permit in addition to, or in lieu of the mass limit established pursuant to this section.

Note: In accordance with s. 283.84, Stats., the department may approve the use of phosphorus trading as a means for a point source to achieve compliance with the water quality based effluent limitation, including a TMDL based limitation. The trade shall be incorporated into the terms of the WPDES permit for the point source and must be approved by the department prior to implementation.

(2) CONCENTRATION BASED LIMITATIONS. Concentration effluent limitations calculated under s. NR 217.13 shall be expressed as a monthly average in permits, except for concentrations of less than or equal to 0.3 mg/L where limitations may be expressed as annual averages. If a concentration limitation expressed as an annual average is included in a permit, a monthly average con-

centration limitation equal to three times the water quality based effluent limitation calculated under s. NR 217.13 shall also be included in the permit.

(3) MASS BASED LIMITATIONS. Concentration effluent limitations as calculated under s. NR 217.13 shall be converted into mass effluent limitations using the effluent flow identified in s. NR 217.13 and an appropriate conversion factor, and expressed as a monthly average in the permit, except for concentration based limitations of less than or equal to 0.3 mg/L where mass limitations may be expressed as annual averages.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.15 Determination of necessity for water quality based effluent limitations for phosphorus. (1) (a) *General*. The department shall include a water quality based effluent limitation for phosphorus in a permit whenever the discharge or discharges from a point source or point sources contain phosphorus at concentrations or loadings which will cause, has the reasonable potential to cause or contribute to, an exceedance of the water quality standards in s. NR 102.06 in either the receiving water or downstream waters. The department shall use the procedures in this section to make this determination.

(b) *Permittees with existing phosphorus limitations.* If a permittee has a technology based phosphorus limitation in a permit that is less restrictive than a water quality based effluent limitation for phosphorus calculated pursuant to s. NR 217.13, then the department shall include the water quality based effluent limitation in the permit.

(c) *Permittees without existing phosphorus limitations.* If a permittee discharges phosphorus, but does not have a technology based limitation for phosphorus in its permit, the department shall use the procedures in this paragraph to determine whether a discharge will cause, has the reasonable potential to cause or contribute to an exceedance of the phosphorus water quality criterion in s. NR 102.06 in the receiving or downstream waters, and whether to include a water quality based effluent limit for phosphorus in the WPDES permit.

1. Using at least 11 daily discharge concentrations of phosphorus, if the upper 99th percentile of the 30 day average discharge concentration of phosphorus exceeds the potential phosphorus limitation calculated under s. NR 217.13, then the water quality based effluent limitation for phosphorus shall be included in the WPDES permit. If the upper 99th percentile of the 30 day average discharge concentration of phosphorus is less than the potential phosphorus limitation calculated under s. NR 217.13, then a water quality based effluent limitation for phosphorus is not required in the WPDES permit. The upper 99th percentile of available discharge concentrations shall be calculated pursuant to s. NR 106.05 (5).

2. If 11 daily discharge concentrations of phosphorus are not available for a permittee, then a water quality based effluent limitation for phosphorus shall be included in the permit when the mean of available effluent concentrations is greater than one−fifth of the limit.

3. If no phosphorus effluent data is available for an existing permittee, the department may require phosphorus sampling as part of a permit application for reissuance to determine whether a water quality based effluent limit is necessary in the WPDES permit under par. (a), or the department may use effluent data information from similar point sources to make the determination under par. (a).

Note: The department will develop guidance regarding the administration of this section to ensure that permitted discharges with a reasonable potential to cause or contribute to exceedances of the applicable phosphorus water quality criterion in s. NR 102.06 are identified.

(d) *Sampling.* Prior to permit reissuance, a permittee discharging any phosphorus shall collect effluent samples of phosphorus at a frequency specified by the department in the permit application for reissuance.

(e) *New dischargers.* The department shall include a water quality based phosphorus limitation in a permit for a new discharger if the department determines the new discharger will discharge phosphorus at concentrations or loadings which may cause or contribute to exceedances of the water quality criteria in s. NR 102.06 in either the receiving water or downstream waters. To estimate the amount of phosphorus discharged by a new discharger, the department may consider projected discharge information from the permit applicant and phosphorus discharge information from similar sources.

(2) If the department determines a water quality based effluent limitation is not necessary in a permit based on the procedures in this section, the department may still require monitoring for phosphorus discharges.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10; correction in (1) (c) 1. made under s. 13.92 (4) (b) 7., Stats., Register November 2010 No. 659.

NR 217.16 Relationship of WQBELs and TMDL based limitations. (1) In addition to a water quality based effluent limitation calculated pursuant to s. NR 217.13, the department may derive a water quality based effluent limitation for phosphorus consistent with the wasteload allocation and assumptions of a US EPA approved TMDL that is designed to achieve water quality standards in ch. NR 102. This TMDL based limitation may be included in a permit in addition to, or in lieu of, the water quality based limitation calculated under s. NR 217.13. When deciding whether to use a TMDL based limit as a substitute for the limitation calculated under s. NR 217.13, the department shall consider the following factors:

(a) The degree to which nonpoint sources contribute phosphorus to the impaired water;

(b) Whether waters upstream of the impaired waters are meeting the phosphorus criteria; and

(c) Whether waters downstream of the impaired water are meeting the phosphorus criteria.

(2) If the phosphorus limitation based on an approved TMDL is less stringent than the water quality based effluent limitation calculated in s. NR 217.13, the department may include the TMDL based limit in lieu of the limit calculated in s. NR 217.13 if the limit calculated under s. NR 217.13 has not yet taken effect. If the department includes the TMDL based limitation for phosphorus in the WPDES permit in lieu of the limit calculated in s. NR 217.13, the TMDL based limit may remain in the permit for up to two permit terms to allow time for implementation of the TMDL, or the implementation period specified in the TMDL, whichever is less. The department may include a schedule of compliance to achieve a TMDL based limit if the department determines a schedule of compliance is necessary. If after two permit terms, the department determines the nonpoint source load allocation has not been substantially reduced, the department may impose the more stringent water quality based effluent limitation calculated under s. NR 217.13, or may include the TMDL based limitation for an additional permit term if the department determines there will be significant nonpoint source load reductions within the upcoming permit term. If the department decides to remove a TMDL based phosphorus limit from a permit and instead include a more stringent water quality based phosphorus limit in the permit calculated under s. NR 217.13, the department may provide a schedule of compliance for the more stringent limit if the department determines additional time is needed for the permittee to comply with the revised limit. Such schedules shall require compliance as soon as possible, but in no case no more than five years from the date that the permit is reissued or modified to include the revised effluent limitations.

(3) If a phosphorus water quality based limit calculated under s. NR 217.13 has already taken effect in a permit, the department may replace the limit with a less stringent TMDL based limit, if allowed pursuant to antidegradation procedures in ch. NR 207.

Note: The TMDL based limitation may be less stringent than the water quality based effluent limitation calculated under s. NR 217.13 in cases where nonpoint sources are the significant phosphorus sources responsible for the impairment.

(4) If the phosphorus limitation based on an approved TMDL is more stringent than the water quality based effluent limitation calculated under s. NR 217.13, the department shall include the more stringent TMDL based limitation in the WPDES permit.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.17 Schedules of compliance. (1) GENERAL. (a) Except as provided in sub. (4), the department may provide a schedule of compliance for a water quality based phosphorus limitation in a WPDES permit, where based on available information the department finds that:

1. The schedule of compliance will lead to compliance with the water quality based effluent limitation as soon as possible; and

2. The schedule of compliance is appropriate and necessary because the permittee cannot immediately achieve compliance with the water quality based effluent limitation based on existing operation of its treatment system.

Note: Before any compliance schedule is established in a permit pursuant to this subchapter, the department must make the finding in par (a).

(b) In determining whether a compliance schedule is appropriate and determining the length of the compliance schedule, the department shall consider all of the following factors:

1. Whether there is any need for modifications to the treatment facilities, operations or measures to meet the water quality based effluent limitation, and if so, how long it will take to implement the modifications. If the department determines that a permittee only needs to make operational changes to achieve compliance with a limitation, the compliance schedule shall be as brief as possible and only allow time for operational start−up adjustments.

2. The amount of time the discharger has already had to meet the water quality based effluent limitation under prior permits.

3. The extent to which the discharger has made good faith efforts to comply with the water quality based effluent limitation and other requirements in prior permits, if applicable.

4. The extent to which the phosphorus removal process technologies have been developed and proven to be effective.

(c) In determining whether a compliance schedule is appropriate and determining the length of the compliance schedule, the department may also consider any of the following factors:

1. Whether there is a need to acquire a substantial amount of property to accommodate the needed modifications; and

2. Whether there is a need to develop an extensive financing plan and obtain financing for the proposed treatment plant upgrade.

Note: A compliance schedule may be provided for a water quality based effluent limit for phosphorus calculated under s. NR 217.13 and a TMDL based limit for phosphorus.

(2) MAXIMUM COMPLIANCE SCHEDULE PERIOD. Except for situations where filtration or a similar phosphorus removal process is required, any compliance schedule established by the department under sub. (1) may not exceed seven years from the date a permit was first modified or reissued to include a water quality based phosphorus limit calculated under s. NR 217.13. Where compliance with the water quality based phosphorus limit requires the construction of filtration or a similar phosphorus removal process, the department may grant a schedule of compliance not to exceed nine years from the date that the permit is first reissued or modified to include effluent limitations developed under provisions of this subchapter. In cases where a compliance schedule extends beyond five years, the department may revise the schedule at reissuance or pursuant to a permit modification.

(3) REQUIREMENTS, LIMITATIONS, DATES, AND REPORTING. When granting a schedule of compliance, the department shall include, as conditions of the permit, the following:

(a) Dates for achievement of interim requirements. The time between interim dates may not exceed one year.

(b) A sequence of actions or operations that may include, as appropriate, but are not limited to:

1. Development and implementation of a phosphorus discharge optimization plan for the current operation.

2. Preparation of preliminary and final designs for new or modified treatment technology.

3. Initiation and completion of construction.

(c) Interim effluent limitations representing good management and operation for similar treatment processes based on performance of other wastewater treatment facilities that will lead to compliance with the final water quality based effluent limitation.

(d) A requirement that no later than 30 days following each interim date and the final date of compliance, the permittee shall notify the department in writing of its compliance or non−compliance with the interim or final requirements, including submittal of progress reports. If any interim requirement will take more than one year to complete, the permit shall also include a projected completion date for the interim requirement.

(e) The final water quality based effluent limit for phosphorus calculated pursuant to s. NR 217.13 shall be included in the permit even if the limit is not effective during the permit term. The department may revise the final limit at permit reissuance or pursuant to a permit modification.

(f) If the permittee chooses to engage in pollutant trading as a means to achieve compliance with interim limitation or final water quality based effluent limitations, then the terms and conditions related to the trade shall be incorporated into the permit.

(4) NEW DISCHARGERS. Any new discharger may not receive a compliance schedule to achieve compliance with a phosphorus water quality based effluent limitation.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.18 Watershed adaptive management option. (1) GENERAL. The adaptive management option is a strategy to achieve the phosphorus water quality criteria in s. NR 102.06 in the most economically efficient manner, and as soon as possible, taking into consideration the contributions of phosphorus from point and nonpoint sources in a watershed.

(2) APPLICATION. If requested by the permittee in the permit application for reissuance and if approved by the department, the permittee may implement a watershed adaptive management approach under this section as a means to achieve compliance with the phosphorus water quality standards in s. NR 102.06. The department may approve and authorize the adaptive management option in this section only if the permittee demonstrates and the department concurs that all of the following conditions are met:

(a) The exceedance of the applicable phosphorus criterion in s. NR 102.06 is caused by phosphorus contributions from both point sources and nonpoint sources.

(b) Either the sum of the nonpoint sources and the permitted municipal separate storm sewer system contribution of phosphorus to the receiving water is at least 50 percent of a total contribution within the watershed of the receiving water where the applicable phosphorus criterion in s. NR 102.06 is exceeded; or the permittee demonstrates that the applicable phosphorus criterion cannot be met in the watershed without the control of phosphorus from nonpoint sources.

(c) Documentation that the proposed water quality based effluent limit in the applicant's permit will require filtration or other equivalent treatment technology to achieve compliance.

(d) The permittee has submitted an adaptive management plan that identifies specific actions to be implemented that will achieve compliance with the applicable phosphorus criterion in s. NR 102.06 through verifiable reductions of phosphorus from point

and nonpoint sources in the watershed. At a minimum, the plan shall include the following:

1. An analysis of the levels of phosphorus in the permittee's effluent and significant sources of point and nonpoint phosphorus loadings in the watershed.

2. Goals and measures for determining whether the actions identified in the plan are effective in achieving compliance with the applicable phosphorus criterion in s. NR 102.06.

3. Identification of any anticipated partners that will assist in implementing the phosphorus reductions to achieve compliance with the applicable phosphorus criterion in s. NR 102.06, including the partner's level of support for the plan.

4. A demonstration that the permittee has the ability to fund and implement the plan either individually, or in conjunction with other permittees and nonpoint sources, or other partners, including municipal and county governments, in the watershed. Plans should include any contracts reflecting commitments by partners to implement applicable actions.

(3) PERMIT TERMS AND CONDITIONS. If the department determines that the permittee has provided all necessary information and the conditions in sub. (2) have been met, it may issue a permit that includes watershed adaptive management actions to achieve compliance with the applicable phosphorus criterion in s. NR 102.06 on a schedule approved by the department. At a minimum, the permit shall include the following:

(a) Monitoring in the receiving water at locations and times established in the permit to assess phosphorus loading and to document progress toward achieving the applicable phosphorus criterion in s. NR 102.06. The department shall also require permittees to monitor, record and report the mass and concentration of phosphorus in the effluent at an appropriate frequency specified by the department in the permit.

(b) Requirements to design and implement the actions identified in the permittee's approved adaptive management plan in accordance with the goals and measures identified in the plan and any compliance schedule included in the permit.

(c) Requirements to optimize the permittee's treatment system to control phosphorus.

(d) Reporting procedures and deadlines for all monitoring, assessment and data gathering requirements in the plan. Permittees shall be required to file and the department will review an annual report that identifies implementation of actions in the plan that were completed the previous year, and that documents any progress in achieving the goals and measures in the adaptive management plan. Adjustment or corrections, to the extent that they are needed, will be incorporated into the permit via permit modification procedures.

(e) Numerical effluent limitations as follows:

1. All permits issued under the adaptive management option in this section shall include water quality based effluent limitations calculated consistent with the federal water pollution control act, 33 USC 1251 to 1387, that are established according to s. NR 217.13 or a US EPA approved TMDL. These limitations shall take effect in accordance with the timeframe established in this paragraph, or pursuant to par. (g) if the adaptive management option is terminated.

2. In the first permit reissuance term following approval by the department under sub. (2), the initial interim effluent limitation shall be no higher than 0.6 mg/L of total phosphorus expressed as a six−month average. An effluent limit not to exceed 1.0 mg/L of total phosphorus expressed as a monthly average shall also be included in the permit. The department may allow the permittee a compliance schedule that may not exceed five years if necessary to meet this interim limitation.

3. If the permittee has met all of the requirements of its previous permit, but the monitoring data of the receiving water indicate that the applicable phosphorus water quality criterion in s. NR 102.06 has not been met by the time the first permit issued under the adaptive management option expires, the department may issue a subsequent adaptive management permit. The subsequent permit shall include an interim effluent limitation of no higher than 0.5 mg/L expressed as a six−month average. An effluent limit not to exceed 1.0 mg/L of total phosphorus expressed as a monthly average shall also be included in the permit. The subsequent permit shall also include an updated adaptive management plan to achieve the phosphorus water quality criterion in s. NR 102.06. The department may allow the permittee a compliance schedule that may not exceed five years if necessary to meet this interim limitation.

4. If by the expiration of the second permit issued under the adaptive management option, monitoring data collected for the receiving water indicate that the applicable phosphorus criterion under s. NR 102.06 has not been met, the department shall require compliance with a water quality based effluent limitation for phosphorus calculated under s. NR 217.13 or a US EPA approved TMDL. The department may allow the permittee a compliance schedule that may not exceed five years if necessary to meet this limitation.

(f) A statement that failure to implement any of the terms or conditions established under pars. (a) through (e) above, is a violation of the permit.

(g) Provisions that the department may terminate the adaptive management option for a permittee and require compliance with a phosphorus effluent limitation calculated under s. NR 217.13 or a US EPA approved TMDL based on any of the following reasons:

1. Failure to implement the adaptive management actions in accordance with the approved adaptive management plan and compliance schedule established in the permit.

2. New information becomes available that changes the department's determinations made under sub. (2).

3. Circumstances beyond the permittee's control have made compliance with the applicable phosphorus criterion in s. NR 102.06 pursuant to the plan's goals and measures infeasible.

4. A determination by the department that sufficient reductions have not been achieved to timely reduce the amount total phosphorus to meet the criteria in s. NR 102.06.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

NR 217.19 Variances for stabilization ponds and lagoon systems. (1) GENERAL. (a) An owner or operator of a permitted wastewater treatment system that consists primarily of a stabilization pond system or a lagoon system may apply for a variance to the phosphorus water quality based effluent limitations pursuant to s. 283.15 (4) (a) 1. f., Stats., using the procedures in this section.

Note: Stabilization ponds and lagoons are operated primarily by communities serving a population of 2000 or less and small industries. With currently available technology that could be used in conjunction with stabilization ponds or lagoons, it is unlikely that phosphorus water quality based effluent limits less than 1 mg/L can be consistently met. To meet phosphorus water quality based effluent limits of less than 1 mg/L, it will be necessary for owners of the systems to construct new wastewater treatment plants which could result in substantial and widespread adverse social and economic impacts.

(b) A new discharger may not receive approval for a variance under this section or pursuant to any other variance procedure.

(2) APPLICATION FOR A VARIANCE. (a) The application for a variance under this section shall be submitted with the WPDES permit application for reissuance, or within 30 days after the permittee receives written notification of the proposed phosphorus limits, if the notification occurs later. The application shall be submitted on the phosphorus lagoon and stabilization pond variance form made available from the department or on a form containing equivalent information.

Note: Owners or operators of stabilization ponds or lagoon systems may obtain the variance application form from the offices of the department of natural resources, bureau of watershed management at 101 South Webster Street, P.O. Box 7921, Madison, Wisconsin 53707. The form will provide guidance on the type of information needed to demonstrate widespread social and economic impacts.

(b) The application shall, at a minimum, include the following information:

1. Information required by s. NR 200.22, except for the information in s. NR 200.22 (1) (e) 6.

2. A statement that the permittee is seeking a variance pursuant to this section and s. 283.15 (4) (a) 1. f., Stats.

3. Information on the number and volume of lagoon or pond treatment cells, treatment processes, discharge periods, retention times, population served, influent flow, and available capacity for holding wastewater.

4. Other information requested by the department that is relevant to the review conducted under sub. (3).

Note: It is recommended that the permittee ask for calculation of potential phosphorus water quality based limits at least 12 months prior to permit expiration. This information will help the permittee complete their variance request portion of the permit application which is due 180 days prior to permit expiration.

(3) DEPARTMENT REVIEW. (a) The department shall review the submitted application for the variance and determine whether the permittee can achieve the phosphorus effluent limitations calculated pursuant to s. NR 217.13 without widespread adverse social and economic impacts. In making this determination, the department shall:

1. Compare the calculated phosphorus effluent limitations to the phosphorus effluent data submitted under sub. (2). If the permittee does not have sufficient phosphorus discharge data for its system, the department may augment the data set with effluent data from a similar lagoon or pond system in the state to make the comparison. The department may apply statistical methodologies to make its determination on the ability of the current lagoon or stabilization pond system to meet phosphorus limitations.

2. Evaluate the financial affordability analysis submitted by the permittee in response to the variance application requirement in s. NR 200.22 (p).

Note: The department may use a US EPA publication titled, Interim Economic Guidance for Water Quality Standards — Workbook, EPA−823−B−95−002, March 1995, which provides information on evaluating economic and social impacts.

(b) The department's decision to approve or deny a variance under this section shall be made on or before the date of the s. 283.53 (3) (d), Stats., public notice for the proposed permit reissuance and shall be made in accordance with the following:

1. If the department determines that the permittee cannot meet the phosphorus water quality based effluent limitation without widespread adverse social and economic impacts, the department shall approve the variance. If the variance is approved, the department shall specify in the permit that the variance has been granted for phosphorus, and the requirements in sub. (4) shall also be included in the permit.

2. If the department determines that the permittee can meet the phosphorus effluent limitations without widespread adverse social and economic impacts or that effluent limitations are not necessary as determined by s. NR 217.15, the department shall deny the variance and notify the applicant of this determination in writing.

(c) If the department denies a variance under this section, a permittee may not apply again after the permit is issued for a variance from the phosphorus water quality standard based on the factor in s. 283.15 (4) (a) 1. f., Stats., for the same permit term.

(d) A permittee may seek a variance from a phosphorus limit in a reissued WPDES permit based on the factors in s. 283.15 (4) (a) 1. a. to e., Stats., and using the procedures and requirements in s. 283.15, Stats., and ch. NR 200.

Note: All variances are subject to US EPA review and approval.

(4) PERMIT TERMS IF VARIANCE IS APPROVED. If the department approves a variance to the phosphorus effluent limitations under this section, the following requirements shall be included in the reissued permit:

(a) The permit shall include a phosphorus variance effluent limitation as follows:

1. The numeric limitation shall equal the upper 99th percentile of representative daily discharge concentrations (one−day P_{99}) as calculated in s. NR 106.05 (5) (a).

2. The variance limitation shall be expressed as a daily maximum concentration.

(b) The permittee shall conduct monitoring of phosphorus during discharge periods at a frequency specified in the permit.

(c) The permittee shall, to the extent practicable, identify and minimize the non−domestic sources of phosphorus to the system and operate the treatment system to minimize exceedances of the calculated limits.

(d) The permittee shall investigate treatment technologies, process changes, pollutant source reduction steps, wastewater reuse or other techniques that may result in compliance by the permittee with the applicable phosphorus water quality standard, and shall submit reports on those investigations as required by the department.

(5) CONTINUED VARIANCES. If a permittee received approval for a variance to the phosphorus standard under this section in a reissued permit, the permittee may request a continued variance from the phosphorus standard in a subsequent reissued permit pursuant to the procedures and requirements in this section.

History: CR 10−035: cr. Register November 2010 No. 659, eff. 12−1−10.

EPA's Review of Water Quality Criteria for Phosphorus in Rivers and Lakes in Wisconsin under Section 303(c) of the Clean Water Act (CWA) WQSTS WI2010-380

Date: DEC 30 2010

I. Summary

A. Date received by EPA

Request for approval letter: December 14, 2010
Attorney General Certification: December 29, 2010

B. Submittal History

On December 29, 2010, EPA received the complete package of final phosphorus water quality standards from Wisconsin Department of Natural Resources (WDNR) for rivers and lakes in Wisconsin, including the portions of Lake Michigan and Lake Superior that are part of Wisconsin, for approval under the CWA section 303(c).

C. Documents included in the submittal:

- Technical Support Document for Wisconsin Phosphorus Water Quality Standards
- Robertson, D.M., B.M Weigel, and D.J. Graczyk, 2008, Nutrient Concentrations and their relations to the biotic integrity of nonwadeable rivers in Wisconsin: U.S. Geological Survey Professional Paper 1754, 81 p.
- Robertson, D.J. Graczyk, P.J. Garrison, L. Wang, G. LaLiberte, and R. Bannerman, 2006, Nutrient Concentrations and Their Relations to the Biotic Integrity of Wadeable Streams in Wisconsin: U.S. Geological Survey Professional Paper 1722, 156 p.
- Certification letter from Wisconsin Attorney General's office, dated December 23, 2010.

D. Other supporting documents provided by Wisconsin:

- Email transmission from Jim Baumann (WDNR) to Brian Thompson (U.S. EPA) on December 16, 2010 regarding derivation of Wisconsin lakes phosphorus criterion

E. Description of Action:

WDNR has adopted, under NR 102.06, statewide phosphorus water quality criteria for flowing waters (rivers and streams) and lakes and reservoirs, including criteria for the portion of the Great Lakes in Wisconsin. The rivers and streams criteria submitted by Wisconsin apply to all flowing waters except for ephemeral streams or streams identified in ch. NR 104 as limited aquatic life waters. The lakes and reservoirs criteria apply to all lakes and reservoirs except for marsh lakes and other wetlands. The Great Lakes criteria consist of criteria for the open waters

of Lake Superior, the open waters of Lake Michigan, the near shore waters of Lake Michigan, and Green Bay in Lake Michigan, which is covered by a separate narrative criterion at NR 102.06(5)(c).

WDNR also adopted a companion NPDES rule at s. NR 217, "Effluent Standards and Limitations for Phosphorus" (NR 217.01-19). NR 217.04 provides for determining when a water quality based effluent limitation (WQBEL) is needed in a WPDES permit and how such a WQBEL is to be calculated. The NPDES rule also establishes compliance schedule provisions, a watershed adaptive management option where it can be documented that phosphorus concentrations are improving in the receiving water, and variance provisions for phosphorus for stabilization pond and lagoon systems. Regarding the NPDES rule, only the compliance schedule authorizing provision at NR 217.17 and the variance provision at NR 217.19 fall under the purview of CWA section 303(c) and this water quality standards review. EPA intends to review NR 217 as a possible revision to Wisconsin's approved NPDES program under 40 CFR 123.62. EPA will contact WDNR when EPA completes that review.

F. Basis of Action:

- Wisconsin Statutes at 281.15
- Clean Water Act, Sections 101(a)(2), 303(c), and 118
- Federal regulations at 40 CFR 131 and 132

II. Areas Affected and Environmental Impacts

A. Area Affected:

The proposed rule applies statewide as identified in Section I.E. above.

B. Environmental Impacts:

1. Aquatic Life:

The rivers and streams criteria were developed to satisfy the requirements of section 303(c)(2)(A) of the CWA and specify water quality criteria for phosphorus that are intended to prevent in-stream algae and other plant growth attributable to phosphorus that could become detrimental to fish and aquatic life and impact designated uses, based on the evaluation of multiple measures of fish and invertebrate community health. The technical justification of the rivers and streams criteria is found in WDNR's technical support document (WDNR 2010), Robertson et al. 2006, and Robertson et al. 2008, all of which are provided in the submission package. Based on evaluation of these materials as described in greater detail below, EPA believes that the criteria are protective of aquatic life.

The lakes and reservoirs criteria were developed to satisfy the requirements of section 303(c)(2)(A) of the CWA and specify water quality criteria for phosphorus that are intended to protect critical environmental needs of aquatic life in lake systems from adverse effects attributable to phosphorus. Since different types of lakes and reservoirs respond to phosphorus

enrichment in different ways based on differences in the biological and physical nature of the lakes, the specific relationships that are the basis of the criteria differ with lake type. Depending on lake type, the criteria prevent disruption of the plant community structure, maintain adequate dissolved oxygen to support aquatic animals, and/or maintain the expected/desired lake fish community. The technical justification of the reservoirs and lakes criteria is found in WDNR's technical support document (WDNR 2010), which is provided in the submission package. Based on evaluation of this document, EPA believes that the criteria are protective of aquatic life.

2. Human Health:

The lakes criteria are also intended to prevent adverse impacts on recreation due to nuisance blooms of algae. These criteria were designed to limit nuisance algal bloom conditions to infrequent occurrence. The technical justification of the reservoirs and lakes criteria is found in WDNR's technical support document (WDNE 2010), which is provided in the submission package. Based on evaluation of this document, EPA believes that the criteria are protective of recreational uses.

III. CWA Sections 101(a)(2)/303(c)(2)/118(c)(2)/40 CFR 131 and 132 Review

A. EPA's authority under section 303(c)(2) of the CWA:

Water quality standards requirements of CWA sections 101(a)(2) and 303(c)(2) are implemented through federal regulations contained in 40 CFR 131; water quality standards requirements of CWA section 118, specific to waters of the Great Lakes System, are implemented through federal regulations contained in 40 CFR 132. CWA sections 303(c)(2) and (c)(3) and implementing regulations at 40 CFR 131.21 require EPA to review and approve or disapprove state-adopted water quality standards. In making this determination, EPA must consider the following requirements of 40 CFR 131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria protective of the designated uses;
- whether the state has followed legal procedures for revising its standards;
- whether state standards are based on appropriate technical and scientific data and analyses; and
- whether the state's submission includes certain basic elements as specified in 40 CFR 131.6.

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water." Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes

EPA is required to review and either approve or disapprove new and revised water quality standards submitted by states and tribes. More specifically, possible EPA actions include:

- **Approval** (where EPA has concluded that approval of certain revisions will have no effect on listed species, or is otherwise not subject to ESA consultation),
- **Approval subject to ESA consultation** (where EPA has concluded that certain revisions may affect listed species (including beneficial effects)),
- **Disapproval** (where EPA has concluded that certain revisions do not meet the requirements of the CWA or federal regulations and guidance), and
- **No EPA action** (where EPA has concluded that certain revisions are not revisions to the State's or Tribe's WQS and therefore do not need to be reviewed under Section 303(c) of the CWA.

Consistent with federal regulations at 40 CFR 131.21, new or revised water quality standards do not become effective for CWA purposes until they are approved by EPA.

B. EPA's Review of Wisconsin's Proposed Rules:

WDNR provided the proposed phosphorus criteria rules to EPA on March 17, 2010. EPA submitted comments to WDNR in a letter on April 30, 2010, addressing several aspects of the proposed rules. Those comments are summarized below:

1) Wisconsin should adopt a statement that nutrient water quality criteria should provide for the attainment and maintenance of the water quality standards of downstream waters.
2) Without supporting data and analysis, EPA cannot approve the portion of the rule automatically authorizing a variance for all lagoon systems serving populations under 2,000.
3) Wisconsin should continue its work in developing the technical support document of the scientific basis for the criteria.

In response, WDNR made several revisions to the final rule and augmented its technical support document for the criteria derivation. In NR 217.13(3), WDNR added language indicating that 1) "For discharges of phosphorus directly to inland lakes, reservoirs and other receiving waters which do not exhibit a unidirectional flow at the point of discharge, the department shall set the effluent limit equal to the criterion for the receiving water or the downstream water," and 2) WDNR review of variance applications will include evaluation of financial affordability of each permittee that applies for a variance. In addition, Wisconsin's revised technical support document provides additional technical information on how the rivers and streams and the lakes and reservoirs criteria were derived.

The record shows that the rule revisions and additional information provided by WDNR adequately address EPA's comments on the proposed rule. WDNR's added language in the final rule specifying that it will set the effluent limits equal to the criteria for direct dischargers into lakes will help protect downstream waters within the state. WDNR's added language that review of variance applications will include evaluation of financial affordability of each permittee that applies for a variance addresses the intent of the Federal regulation at 40 CFR 131.13 regarding policies that may affect water quality standards. The revised technical support document

provides the information needed to allow EPA to evaluate the scientific defensibility of the criteria for rivers and streams and the lakes and reservoirs.

C. Public Comments Raised on WDNR's proposed phosphorus criteria rule:

WDNR published proposed rules and held public hearing on the phosphorus criteria. The public comments to the proposed rules and WDNR's response to the public comments can be accessed at: https://health.wisconsin.gov/admrules/public/Rmo?nRmoId=4783 under "Report to the Legislature."

EPA considered the information in WDNR's document cited above, along with the phosphorus rules adopted by Wisconsin, and the technical support materials provided by Wisconsin and cited in I.C. and D. above. For the reasons provided in Section III. D. 2. below, EPA concludes that the phosphorus water quality standards at NR 102.06, the compliance schedule authorizing provision at NR 217.17, and the variance rule at NR 217.19 are consistent with the requirements of section 303(c) of the CWA and federal regulations at 40 CFR 131.

D. EPA's Review of Wisconsin's Final Rules:

1. Review of Submittal for Completeness:

Regulatory Requirement:	Wisconsin's Rule Submittal:
Use designations must be consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act **(40 CFR 131.6(a))**	The proposed nutrient criteria do not affect the designated uses of the rivers and streams or the lakes and reservoirs in Wisconsin.
Methods used and analyses conducted to support WQS revisions must be included in the submission **(40 CFR 131.6(b))**	Wisconsin provided the methods and analyses in support of the proposed nutrient water quality criteria. These methods and analyses are included under I.C., above, "Documents included in the submittal" and I.D., "Other supporting documents."
Water quality criteria must be sufficient to protect the designated uses of Wisconsin surface waters **(40 CFR 131.6(c))**	Wisconsin is adopting nutrient water quality criteria in order to protect the designated uses in Wisconsin. Based on "EPA's Review of Submittal for Scientific Supportability" (Section III. C.2., below), EPA is determining that the proposed criteria are protective of Wisconsin's designated uses.
Antidegradation policy must be consistent with §131.12 **(40 CFR 131.6(d))**	The proposed nutrient criteria do not affect Wisconsin's antidegradation policy or implementation procedures.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law must be included in the submission. **(40 CFR 131.6(e))**	Legal certification was provided by letter from the Wisconsin Deputy Attorney General.
General information must be included which aids the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which their application and implementation. **(40 CFR 131.6(f))**	Wisconsin provided the necessary information addressing the scientific basis supporting the proposed nutrient water quality criteria. The list of this information is under Section I.B. Submittal History, above.

2. EPA's Review of Submittal for Scientific Defensibility and Consistency with CWA and Federal Regulations:

The documents provided by WDNR and cited in Section I.C. and D. above describe the scientific method and the statistical analysis that WDNR used in deriving the criteria. EPA's review and conclusions are presented below by water body type.

Rivers and Streams

Wisconsin's rivers and streams phosphorus criteria are based upon observed correlations between increasing concentrations of phosphorus and changes indicative of disturbance in commonly used and widely accepted measures of plant, fish, and macroinvertebrate community health. These measures include a diatom nutrient index, a diatom siltation index, a diatom biotic index, the Hilsenhoff Biotic Index, percentage of EPT (the aquatic insect orders *Ephemeroptera*, *Plecoptera* and *Trichoptera*) individuals, the percentage of EPT taxa, a fish index of biotic integrity, the percentage of carnivorous fish present in a sample at a site, and the percentage of intolerant fish present in a sample at a site. Such aquatic life plant and animal assemblage measures are among those that are commonly used by states, tribes, and EPA to assess ecosystem health and determine whether or not aquatic life uses of rivers and streams are impaired. (EPA 2002, p. 3-1 to 3-246).

These metrics (i.e., those listed in the preceding paragraph) were selected from among all biological indicators for which Wisconsin collects data because they are ecologically significant (i.e., the metric is a strong indicator of community health) and because of the statistical significance of their correlation to phosphorus concentrations. Data were collected for the indicators across the entire spectrum of phosphorus conditions in the State of Wisconsin to ensure that as many aspects of biological response across the gradient of phosphorus concentrations as possible were considered. Subsequently, a phosphorus threshold or concentration at which significant biological effects were observed was calculated for each metric.

WDNR used change point analysis to identify points along a gradient of phosphorus concentrations where a response in the biological indicator occurred. Multiple change points were determined and evaluated based on expert knowledge of the expected biological condition of Wisconsin rivers and streams and the ways in which Wisconsin rivers and streams respond to increasing concentrations of phosphorus. Individual change points were aggregated to yield a composite estimate of the phosphorus concentration expected to protect aquatic life uses of Wisconsin streams, in a process that is analogous to the way biological assessment data from multiple biological indicators are routinely aggregated by states into a single determination of aquatic life use attainment for purposes of identifying attaining and impaired waters under section 303(d) of the CWA. Wisconsin used the median of the selected phosphorus thresholds in establishing the criteria. While the evaluation of any one of these indicators by itself may not fully address aquatic life community health nor provide absolute certainty in an observed threshold value, the similarity in the threshold values of the selected biological metrics provides greater confidence that the median of the thresholds is an accurate indicator of phosphorus concentrations necessary to protect aquatic life uses of Wisconsin's surface waters. Using a

median of thresholds provides the most accurate estimate of where effects are occurring because of the uncertainty around each individual metric.

Subsequent to Wisconsin's completion of adoption of its phosphorus criteria for rivers and streams, EPA published technical guidance to states and tribes on how nutrient criteria can be derived from biological response data (EPA 2010). This guidance was developed by EPA to address scientific questions about the appropriate mechanism for deriving nutrient criteria based on empirical observations of biological responses along a gradient of nutrient conditions. In addition, this 2010 EPA guidance was reviewed and accepted by the EPA Science Advisory Board's Ecological Processes and Effects Committee. The guidance recommends a four-step process described in the document as follows:

- In the first step, conceptual models representing known relationships between nitrogen (N) and phosphorus (P) concentrations, biological responses, and attainment of designated uses are developed for the study area. To facilitate developing these models, the guidance document provides detailed conceptual models for lakes and streams that can be modified according to the characteristics of the local study area.

- In the second step, data are assembled and initial exploratory analyses are performed. Variables are selected during this step that represent different concepts shown on the conceptual model, including variables that represent N and P concentrations, variables that represent responses that can be directly linked with designated uses, and variables that can potentially confound estimates of stressor-response relationships. After selecting variables and assembling data, these data are explored to provide insights into how different variables are distributed and how groups of variables covary with one another. These exploratory analyses inform subsequent development of formal statistical models.

- In the third step, stressor-response relationships are estimated between N and P concentrations and the selected response variables, and criteria are derived from these relationships. The guidance document presents an analysis approach that emphasizes *classification*, to maximize the accuracy and precision of estimated stressor-response relationships, and *simple linear regression*, to provide stressor-response relationships that can be most easily interpreted for criteria derivation. Methods for interpreting simple linear regression models in terms of predicting the probability of different outcomes are discussed in the context of criteria derivation.

- In the final step, the accuracy and precision of estimated stressor-response relationships are evaluated and the analyses documented. The accuracy of estimated relationships is evaluated with regard to the possible influence of known confounding variables as identified by the conceptual model or by exploratory data analysis. The required precision of estimated relationships depends strongly on the relevant management decisions, and so, evaluating precision is discussed in this context.

Since Wisconsin completed adoption of its rules prior to publication of the EPA guidance, Wisconsin was not able to employ directly the EPA-recommended procedures in developing its phosphorus criteria. However, despite being arrived at independently, the criteria development

process followed by WDNR is largely consistent with the process recommended by EPA and therefore scientifically-defensible, as discussed below.

Step 1. A conceptual model is developed.

Pages three through four of WDNR's document, "Wisconsin Phosphorus Water Quality Standards Criteria: Technical Support Document," (the phosphorus TSD) include a verbal conceptual model of the way phosphorus enrichment affects rivers and streams in Wisconsin, consistent with the recommendations in EPA's 2010 guidance.

Step 2. Data are assembled and initial exploratory analyses are conducted.

As documented in the phosphorus TSD (pages 6 – 15), WDNR began doing preliminary work investigating the relationship between phosphorus and condition of rivers and streams in the early 1980s. Beginning in 2001, WDNR began a partnership with USGS intended to:

1. Describe how nutrient – both phosphorus and nitrogen – concentrations and the biotic community vary throughout Wisconsin.
2. Determine which environmental characteristics are most strongly related to the distribution of nutrient concentrations.
3. Determine reference water quality and biotic conditions for different geographic areas across the state.
4. Determine how the stream biotic communities respond to changes in nutrient concentrations.
5. Determine the best regionalization scheme to describe the patterns in reference conditions and responses in water quality and in the biotic community.
6. Develop new indices or algorithms to estimate nutrient concentrations in streams from a combination of biotic indices.

As stated in the phosphorus TSD at pages 6-7, the results of these studies are reported in two documents jointly prepared by WDNR research staff and USGS staff. The first report, "Nutrient Concentrations and Their Relations to the Biotic Integrity of Wadeable Streams in Wisconsin", was based on analyzing data from 240 smaller and larger streams collected in 2001, 2002 or 2003.[1] The second report, "Nutrient Concentrations and Their Relations to the Biotic Integrity of Nonwadeable Rivers in Wisconsin", was based on analyzing data from 42 rivers collected in 2003.[2] The studies collected fish, aquatic insect, and water quality data from 282 study sites.

Step 3. Stressor-response relationships are estimated between N and P concentrations and the selected response variables, and criteria are derived from these relationships.

[1] Robertson, D. M., Graczyk, D. J., Garrison, P. J., Wang, L., LaLiberte, G., and Bannerman, R., "Nutrient Concentrations and Their Relations to the Biotic Integrity of Wadeable Streams in Wisconsin", USGS Professional Paper 1722, 2006.

[2] Robertson, D. M., Weigel, B. M., Graczyk, D. J., "Nutrient Concentrations and Their Relations to the Biotic Integrity of Nonwadeable Rivers in Wisconsin", USGS Professional Paper 1754, 2008.

Wisconsin is only proposing criteria for phosphorus at this time. WDNR used the data and analyses generated through its collaboration with USGS to select response variables and begin the process of deriving criteria. This is described in detail on pages 8 – 17 of the phosphorus TSD.

Step 4. The accuracy and precision of estimated stressor-response relationships are evaluated and the analyses documented.

Pages 17 – 21 of the phosphorus TSD describe the additional analyses conducted by WDNR to validate the relationships identified between phosphorus and measures of biological community health. Of particular note is the work conducted by WDNR in the early part of 2010 in direct response to EPA's Science Advisory Board guidance on the use of stressor-response relationships to derive nutrient criteria. WDNR's review of the earlier work in light of the new Science Advisory Board guidance validated the relationships between phosphorus levels and biological health that are the basis for the criteria adopted by WDNR.

In addition, EPA notes that other information and data corroborate WDNR's proposed phosphorus criteria for rivers and streams. Wisconsin's stressor-response analysis across multiple biological metrics is supported by EPA's ecoregional criteria documents (EPA 2000, 2001) in combination with USGS's evaluation (Robertson et al. 2006) of whether there is significant variation across Wisconsin in the biological thresholds that were used to set the criteria. EPA's criteria documents suggest criteria of 70 and 80 µg/l total phosphorus in the southern portion of Wisconsin (Ecoregions 52 and 53). These values are intended to estimate minimally impacted nutrient concentrations, but are not based on biological effects and therefore are not necessarily indicators of the levels that have to be met to assure protection of the designated uses for aquatic life. Wisconsin's criteria for wadeable streams (75 µg/l) and non-wadeable streams (100 µg/l) are fairly close to these values for southern Wisconsin. This suggests that the stressor-response-based criteria proposed by Wisconsin are based on biological responses that occur at relatively low levels of enrichment and relatively limited levels of disturbance. The USGS technical report (Robertson et al. 2006, p 1-2) indicates that although ambient phosphorus concentrations were lower or higher in some ecoregions, the biological indices used by Wisconsin to set the phosphorus criteria responded similarly to changes in phosphorus concentrations across the state. Robertson et al. concluded that although ambient concentrations may be lower in certain regions, the biological thresholds upon which the criteria are established do not vary significantly across the state (Robertson et al. 2006, p. 40-76). Although EPA criteria documents suggest a criterion below 30 µg/l for the northern portion of Wisconsin, EPA's criteria are again based upon an approximation of minimally impacted conditions. Given the relatively undisturbed conditions in northern Wisconsin, it is reasonable to assume that there will be more streams with lower phosphorus concentrations, resulting in a lower criterion based on minimally impacted conditions. The USGS work on similarities in biological responses to phosphorus enrichment across Wisconsin supports the conclusion that higher concentrations can occur in the northern portion and continue to protect aquatic life uses.

Conclusion: EPA finds that WDNR's approach for rivers and streams, summarized in the preceding paragraphs, is scientifically defensible and the criteria for phosphorus for rivers and streams are sufficient to protect uses of the rivers and streams covered by the criteria, consistent

with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Reservoirs and Lakes

The reservoirs and lakes criteria protect aquatic life in and recreational uses of reservoirs and lakes, based on the type of lake. Wisconsin's methodology presented in the TSD identifies objectives and ecological thresholds to protect these critical needs. These objectives include minimizing the frequency of nuisance algal conditions, minimizing shifts in aquatic plant communities, and sustaining fish communities.

Deep, drainage lakes and deep reservoirs (30 µg/L)

WDNR considered recreational and aquatic life uses in deriving criteria for deep, drainage lakes. Recreation uses are protected by limiting the frequency of nuisance algal blooms during the recreation season. Aquatic life uses are protected by maintaining the expected fish community. WDNR used data and analyses from the Minnesota Pollution Control Agency (MPCA 2005) that Minnesota used to support the lakes nutrient criteria which Minnesota adopted and EPA approved in 2008. Using data from Minnesota lakes similar to Wisconsin's deep, drainage lakes, WDNR determined the phosphorus concentration (30 µg/L) that would result in infrequent (5 percent of the time or less) nuisance algal bloom occurrence. WDNR considered additional data and analyses by MPCA for similar lakes in Minnesota in determining that a total phosphorus criterion of 30 µg/l would also be sufficient to protect fish communities in deep drainage lakes.

EPA previously approved Minnesota's lake phosphorus criteria in 2008 (EPA 2008). Deep drainage lakes in Minnesota and Wisconsin occur in the same ecoregions that span both states and support similar biological communities. EPA considers the conditions in Wisconsin and Minnesota are similar enough for Wisconsin to rely on Minnesota data and analyses. Wisconsin used Minnesota data on the frequency of algal blooms based on in-lake phosphorus concentration to develop its phosphorus criterion for its deep lakes. EPA agrees that setting a phosphorus criterion to limit the frequency of algal blooms is a reasonable approach to support recreational uses because Wisconsin is protecting aesthetics. The available data indicate that a phosphorus criterion of 30 µg/L will provide the specified level of protection of recreation from aesthetic impacts due to algae blooms. In addition, the available data indicate that a total phosphorus criterion of 30 µg/L will protect fish communities in deep drainage lakes in Wisconsin (WDNR 2010, p. 26). Therefore, EPA finds Wisconsin's approach to protecting recreation in deep drainage lakes by limiting nuisance algal bloom occurrence to less than 5 percent of the time consistent with section 303(c)(2) of the CWA and Federal regulations at 40 CFR 131.11 as well as with EPA's approval of phosphorus criteria for similar lakes in Minnesota (EPA 2008).

Conclusion: The criteria for phosphorus proposed by Wisconsin are scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Deep, seepage lakes (20 µg/l)

For lakes in the class of deep seepage lakes, WDNR determined that protection of the aquatic community and aquatic life uses would require more stringent phosphorus criteria than the 30 µg/L criterion for the deep, drainage lakes. WDNR based this determination on the fact that retention time is longer in deep seepage lakes so that nutrients are available for a longer period of time and that deep seepage lakes are difficult to restore. To develop criteria for this class of lakes, WDNR used sediment core data to infer minimally impacted conditions at 15 µg/L based on the mean of these cores plus one standard deviation (WDNR 2010, p 29). WDNR also assessed the relationship between phosphorus and dissolved oxygen in the water column and determined that a criterion of 20 µg/L would provide sufficient dissolved oxygen throughout the water column to support the expected biological community characterized by dissolved oxygen-sensitive cool water fish species. EPA agrees with WDNR's rationale that a criterion lower than 30 µg/l is needed to protect aquatic life.

Conclusion: The criteria for phosphorus proposed by Wisconsin are scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Two-story lakes (15 µg/L)

As with the preceding lake class, WDNR determined that protection of aquatic life would require more stringent phosphorus criteria than the 30 µg/l criterion for deep, drainage lakes. This determination was based on the need to protect cold water species in the hypolimnion (WDNR 2010, p 28). WDNR used a reference lake approach for two-story lakes with the objective of maintaining water quality at levels consistent with conditions of minimum human impact in order to protect dissolved oxygen-sensitive coldwater fish species expected to be present in the hypolimnion. WDNR derived the phosphorus criterion through the analysis of sediment cores, setting the criterion equal to 15 µg/L, which is the mean of these cores plus one standard deviation. EPA reviewed this procedure for quantifying the minimally impacted condition and concludes that it is a defensible approach to setting a criterion because this is consistent with EPA's ecoregional criteria document (EPA 2001). EPA notes that figure three on page 29 of the phosphorus TSD presents data from Minnesota that suggests that lake trout are not found in two story lakes at phosphorus concentrations greater than 15 µg/L. Additional information provided by WDNR (Baumann, 2010) indicates that figure three is based on a very small set of data for two story lakes in Minnesota. Furthermore, Wisconsin data for two story lakes show that lake trout do occur in two story lakes with phosphorus concentrations greater than 15 µg/L. Therefore, WDNR's 15 µg/l criterion is protective of the aquatic life use in two story lakes.

Conclusion: The criteria for phosphorus proposed by Wisconsin are scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Shallow lakes (40 µg/L)

Lakes in this class are inherently more productive because they are shallower than the other lake classes. WDNR considered recreational and aquatic life uses in deriving criteria for shallow lakes. In addressing recreational uses, WDNR's objective was to ensure adequate water quality to limit nuisance algal bloom conditions to infrequent occurrence. WDNR's objective for aquatic life uses in shallow lakes was to maintain the macrophyte-dominated aquatic plant community typical of minimally-disturbed lakes of this class. WDNR relied on data and analyses generated by MPCA for similar lakes in Minnesota (MPCA 2005) to determine a phosphorus concentration that would minimize the frequency of nuisance algal blooms and determined that a concentration of 40 µg/l would be sufficient to limit nuisance algal bloom frequency to 10% or less of the recreation season. WDNR used other data and analyses by MPCA for Minnesota to establish the phosphorus concentration associated with a shift from macrophyte dominated to algal dominated during the summer for shallow lakes. The Minnesota data indicate that the start of this shift is apparent at about 40 µg/l total phosphorus (MPCA 2005).

EPA previously approved Minnesota's lake criteria in 2008 (EPA 2008). Shallow lakes in Minnesota and Wisconsin occur in the same ecoregions that span both states and are characterized by similar biological communities and responses to enrichment. In EPA's assessment, the ecoregional conditions in Wisconsin and Minnesota are similar enough to allow Wisconsin to rely on Minnesota data and analyses. Based on similarities between Wisconsin and Minnesota's shallow lakes, EPA considers it reasonable for WDNR to follow Minnesota's approach in limiting nuisance algal blooms to a certain percentage of the time to protect aesthetics. The available data indicate that a phosphorus criterion of 40 µg/l will provide the specified level of protection of recreation from aesthetic impacts due to algae blooms. Similarly, the available data indicate that a total phosphorus criterion of 40 µg/l will prevent transformation of shallow lakes from macrophyte dominated plant communities to suspended algae dominated communities that is characteristic of an enriched condition for shallow lakes in Wisconsin (WDNR 2010, p 30-31). Therefore, EPA considers the Wisconsin approach to protect recreation in shallow lakes by limiting nuisance algal bloom occurrence to less than 10 percent of the time to be consistent with section 303(c)(2) of the CWA and Federal regulations at 40 CFR 131.11 as well as with EPA's approval of phosphorus criteria for similar lakes in Minnesota (EPA 2008).

Conclusion: The criteria for phosphorus proposed by Wisconsin are scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Great Lakes

WDNR used the guidelines from the International Joint Commission for the Great Lakes in setting the criteria of 7 µg/l for Lake Michigan and 5 µg/l for Lake Superior (Phosphorus Management Strategies Task Force 1980). According to the International Joint Commission, the 7 µg/l value for Lake Michigan is based on maintaining the lake at the breakpoint between an oligotrophic and a mesotrophic body of water. The International Joint Commission's

recommendations are the best currently available scientific assessment of the phosphorus levels necessary to protect Lakes Michigan and Superior.

When developing water quality criteria for the Great lakes, under 40 CFR 132.4(e)(2) and (g), for pollutants listed in Table 5 of Part 132, which includes phosphorus, Great Lakes states may apply any methodologies and procedures acceptable under 40 CFR part 131 and consistent with all applicable Federal, state and tribal laws.

Conclusion: The criteria for phosphorus proposed by Wisconsin are scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Green Bay

WDNR adopted narrative nutrient criteria for Green Bay to ensure that water clarity and other phosphorus-related conditions are supportive of a diverse biological community, including submersed aquatic vegetation in shallow water areas. The narrative criterion is: "For the portion of Green Bay from the mouth of the Fox River to a line from Long Tail Point to Point au Sable, the water clarity and other phosphorus-related conditions that are suitable for support of a diverse biological community, including a robust and sustainable area of submersed aquatic vegetation in shallow water areas."

In its Technical Support Document, WDNR identified 60 µg/l total phosphorus and 15 mg/l total suspended solids as numeric translators for this narrative criterion. WDNR then calculates concentrations of 60 µg/l total phosphorus and 15 mg/l total suspended solids as numeric translators of the narrative criterion to meet a Secchi disk depth of 1.2 meters. The numeric translators are not part of the Wisconsin rule, so the state can revise these targets later if it finds that they are not sufficiently protective of aquatic life. EPA finds that this narrative WQS for lower Green Bay is consistent with the Section 101 of CWA goal of protecting aquatic life.

Conclusion: The narrative criterion for Green Bay adopted by Wisconsin is scientifically defensible and consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approvable pursuant to section 303(c)(3) of the CWA.

Other Non-criteria WQS Components of Wisconsin's Submittal:

NR 217.17 Compliance Schedule Authorizing Provision

In *In re Star-Kist Caribe, Inc.*, 3 E.A.D. 172, 175, 177 (1990), the Administrator determined that "the only instance in which [an NPDES] permit may lawfully authorize a permittee to delay compliance after July 1, 1977, pursuant to a schedule of compliance, is when the water quality standard itself (or the State's implementing regulations) can be fairly construed as authorizing a schedule of compliance." With that in mind, EPA has determined that NR 217.17 (i.e., "... the department may provide a schedule of compliance for a water quality-based phosphorus effluent limitation ...") is such a compliance schedule authorizing provision and reviewed it pursuant to CWA 303(c). As a result of its review, EPA has determined that NR 217.17 is approvable as a

compliance schedule authorizing provision consistent with *In re Star-Kist Caribe, Inc., supra,* and EPA's May 10, 2007 memorandum "Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits."

Conclusion: The compliance schedule authorizing provision at NR 217.17 (i.e., "... the department may provide a schedule of compliance for a water quality-based phosphorus effluent limitation ...") is approvable pursuant to section 303(c)(3) of the CWA. In approving NR 217.17 as a compliance schedule authorizing provision pursuant to section 303(c), EPA is not making a determination as to its adequacy pursuant to CWA section 402(b) or 40 CFR 123.61 or 123.62. In addition, this approval is not a determination regarding the adequacy of the state's program or the state's legal authority to implement and administer the NPDES program in accordance with the requirements in CWA section 402(c)(2) or 40 CFR section 123.25.

NR 217.19 Variance Procedures for Permitted Lagoon and Pond Wastewater Treatment Systems

Consistent with Federal regulations at 40 CFR 131.13, variance general policies are subject to review and approval by EPA under section 303(c) of the CWA. EPA has reviewed NR 217.19 and determined that these general variance policies are acceptable general processes for the state to consider variances and are consistent with applicable Federal regulations, including 131.10(g) and 131.13, and EPA General Counsel Opinion No. 58 (1977) on variances from water quality standards.

NR 217.19(4)(a)(1) provides that each permittee granted a variance will receive an initial limit based on the phosphorus level currently achievable by the permittee and that this limit will be equal to the upper 99th percentile of representative daily discharge concentrations expressed as a daily maximum limit. This provision is consistent with the procedure WDNR uses generally to calculate limits based on the level currently achievable, including mercury variances under NR 106.145(5), which was approved by EPA on August 3, 2007. It is also consistent with Procedure 2, Section F.1 of 40 CFR Part 132. The purpose of this Wisconsin provision is to require a limit that will ensure the water quality conditions currently attained continue to be maintained during the term of the variance and that the variance does not allow those conditions at the site to deteriorate. EPA finds that limiting the effluent phosphorus concentration in this way is reasonable and defensible, since the controls necessary to attain this limit will also ensure that the discharge continues to be operated to produce an effluent quality at least as good as the level currently achievable. Although Wisconsin is not required to follow the procedures in the Great Lakes Water Quality Guidance at 40 CFR 132 (the Guidance) for phosphorus, those procedures provide an indication of EPA's expectations regarding variance limits based on the level currently achievable. The Guidance requires that such limits be based on facility-specific data and reflect the level currently achievable by the facility seeking a variance. WDNR's procedure for calculating limits satisfies both of these requirements, and, as noted above, was approved by EPA for mercury, a pollutant which is covered by the Guidance.

In addition, NR217.19 includes a note that given currently available technology for stabilization ponds and lagoons, "it is unlikely that a phosphorus water quality based effluent limit less than 1 mg/L can be consistently met." The note goes on to say that, "[t]o meet phosphorus water quality based effluent limits of less than 1 mg/L, it will be necessary for owners of the systems to

construct new waste water treatment plants which could result in substantial and widespread adverse social and economic impacts." Given the language in this note that constructing new water treatment plans "could result" in substantial and widespread adverse social and economic impacts and given Wisconsin's requirement that each permittee submit a financial affordability analysis, EPA finds that the note does not somehow qualify as a categorical variance. Section 217.19 also includes a note indicating each individual variance from water quality standards granted under NR 217.19 will be submitted to EPA for review and approval. Each individual variance is a water quality standards revision itself and therefore, this provision is also consistent with EPA's regulations on revisions to water quality standards. EPA's review and approval on the individual variance will be based on whether such a variance is consistent with the CWA and EPA's implementing regulations, not on consistency with this procedure.

Conclusion: The variance procedures at NR 217.19 are consistent with applicable requirements of the CWA and EPA's implementing regulations and, thus, approval be pursuant to section 303(c)(3) of the CWA.

3. EPA action on the final phosphorus criteria and procedures submitted by WDNR

The information provided by WDNR meets the substantive requirements of 40 CFR 131.6 for a WQS submittal. The technical information provided by WDNR, listed under Section I.C., "Documents included in the submittal," and Section I.D., "Other Supporting Documents," demonstrate that Wisconsin's approach is reasonable and scientifically supportable and that Wisconsin's phosphorus criteria will provide for the protection of the aquatic life and recreation in Wisconsin's lakes and reservoirs and its streams and rivers.

EPA Action: Approve NR 102.06, Phosphorus Water Quality Standards, subject to consultation under section 7 of the Endangered Species Act.

Approve the following text from NR 217.17(1)(a) as a compliance schedule authorizing provision: "... the department may provide a schedule of compliance for a water quality-based phosphorus effluent limitation ..."

Approve NR 217.19, Variances for Stabilization Ponds and Lagoon Systems. Individual variances still need to be submitted to EPA for review and approval or disapproval.

IV. Endangered Species Act (ESA) Requirements

Consistent with section 7 of ESA and federal regulations at 50 CFR Part 402, EPA is required to consult with U.S. Fish and Wildlife Service (USFWS) on any action taken by EPA that may affect federally-listed threatened and endangered species or their designated critical habitat. Actions are considered to have the potential to affect a listed species if the species or its critical habitat is present in the action area. At the time of reviewing Wisconsin's submission, EPA had initiated but not concluded consultation with the USFWS regarding concurrence on whether EPA's approval action was likely to adversely affect any federally-listed species in Wisconsin.

EPA consulted the USFWS website (www.fws.gov/midwest/Endangered/section7/sppranges/wisc-cty.html) on December 6, 2010, to determine if listed species were present in Wisconsin and to initiate consultation. The website identified the following federally-listed species in Wisconsin.

Seven (7) federally-listed plant species (Dwarf lake iris, Eastern prairie fringed orchid, Fassett's locoweed, Mead's milkweed, Northern wild monkshood, Pitcher's thistle, Prairie bush-clover) occupy upland habitats or other habitats that are not significantly affected by nutrient concentrations in streams or lakes in Wisconsin. Consequently these species are not aquatic dependent. EPA's action will not affect these species and so we did not include them in the biological evaluation.

Three (3) of the federally-listed mammal and bird species (Canada lynx, Gray wolf, Kirtland's warbler) have diets that are not significantly dependent on aquatic or aquatic-dependent species and are terrestrial. EPA determined that these species are not aquatic dependent and EPA's action will not have any effect on these species and we did not include them in the biological evaluation. One (1) of the bird species (Whooping crane) is listed based on an experimental population. The crane will have very limited exposure to water from the aquatic ecosystem due to whooping cranes' omnivorous diet. EPA's action will have no significant effect on this species and we did not include it in the biological evaluation.

Five (5) federally-listed mussels (Higgins eye pearlymussel, Sheepnose, Snuffbox, Spectaclecase, Winged mapleleaf) and two (2) federally-listed aquatic-dependent species (Piping plover and Eastern Massasauga) were considered for possible effects from exposure to criteria concentrations of phosphorus.

EPA has completed its analysis of the effects of phosphorus on these species and nearly completed its biological evaluation documenting its conclusions for submittal to the USFWS. EPA's determination is that EPA's approval of Wisconsin's nutrient criteria is not likely to adversely affect these federally-listed species. The primary mode of impact of phosphorus on aquatic and aquatic-dependent species is the potential for reduction of dissolved oxygen. Phosphorus criteria would reduce areas of low dissolved oxygen through the reduction of phosphorus loads and resulting phosphorus concentrations in surface waters. Further, Wisconsin's water quality standards regulation include dissolved oxygen in surface waters of no lower than 5 mg/L at any time. This dissolved oxygen criterion provides a sound measure of whether impacts on aquatic life are likely occurring. The phosphorus criterion serves to provide Wisconsin with an important tool for ensuring attainment of the dissolved oxygen criterion and protection of aquatic life. According to Johnson et al. (2001), 5 mg/L dissolved oxygen is protective of numerous species, including mussel species.

Hence, phosphorus at the concentrations in the rule should not adversely affect the candidate mussels. Therefore, EPA is not expecting its approval of the phosphorus criteria to adversely affect federally-listed mussels in Wisconsin.

V. Documents Considered by EPA

In addition to the CWA federal regulation at 40 CFR Parts 131 and 132, other federal guidance (the primary documents are listed below), and EPA's Water Quality Standards Handbook (EPA 823-B-94-005a, August 1994), the following list includes the primary references considered in this review.

Baumann J. 2010. Additional information on lake phosphorus criteria. Wisconsin Department of Natural Resources.

Johnson PM, AE Liner, SW Golladay WK Michener. 2001. Effects of drought on freshwater mussels and instream habitat in Coastal Plain tributaries of the Flint River, southwest Georgia (July-October, 2000). Final Report given to The Nature Conservancy Apalachicola River and Bay Project. 30 pp.

MPCA. 2005. Minnesota Lake Water Quality Assessment Report: Developing Nutrient Criteria", Third Edition, September, 2005.

Phosphorus Management Strategies Task Force. 1980. *Phosphorus Management for the Great Lakes, Final Report to the International Joint Commission.* Great Lakes Water Quality Board and Great Lakes Science Advisory Board, Windsor, Ontario. 125 pp.

Robertson, D.M., B.M Weigel, and D.J. Graczyk, 2008, Nutrient Concentrations and their relations to the biotic integrity of nonwadeable rivers in Wisconsin: U.S. Geological Survey Professional Paper 1754, 81 p.

Robertson, D.J. Graczyk, P.J. Garrison, L. Wang, G. LaLiberte, and R. Bannerman, 2006, Nutrient Concentrations and Their Relations to the Biotic Integrity of Wadeable Streams in Wisconsin: U.S. Geological Survey Professional Paper 1722, 156 p.

EPA. 1977. Decision of the General Counsel No. 58, In Re Bethlehem Steel Corporation, March 29, 1977.

EPA. 2000. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion VI. Office of Water. Washington, DC. December 2000. EPA 822-B-00-017.

EPA. 2000. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion VII. Office of Water. Washington, DC. December 2000. EPA 822-B-00-018.

EPA. 2001. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion VIII. Office of Water. Washington, DC. December 2001. EPA 822-B-01-015.

EPA. 2002. Summary of Biological Assessment Programs and Biocriteria Development for States, Tribes, Territories, and Interstate Commissions: Streams and Wadeable Rivers. Office of Environmental Information and Office of Water. Washington, DC. December 2002. EPA-822-R-02-048.

EPA. 2008. Letter from U.S. EPA-Region 5 to Michael J. Sandusky approving Minnesota's water quality standards adopted on March 10, 2008. Letter dated May 23, 2010.

EPA. 2010. Using Stressor-response Relationships to Derive Numeric Nutrient Criteria. Office of Water. Washington, DC. November 2010. EPA-820-S-10-001.

USFWS. 2004. "Higgins Eye Pearlymussel (*Lampsilis higginsii*) Recovery Plan: First Revision". Ft. Snelling, Minnesota. 126 pp.

USFWS. 2008a. "Higgins' Eye Pearly Mussel Recovery" U. S. Fish and Wildlife Service, Rock Island, Illinois, Endangered Species website at www.fws.gov/midwest/rockisland/activity/ENDANGRD/higgins.htm. 4/10/2008.

USFWS. 2008b. "Higgins eye (*Lampsilis higginsii*) Essential Habitat Areas, 2008 Review and Addition of New EHAs." USFWS Endangered Species website at www.fws.gov/midwest/endangered/clams/higginseye/hepmeha.html.

USFWS. 2010. "County Distribution of Wisconsin's Federally Threatened, Endangered, Proposed, and Candidate Species." USFWS – Midwest Region's Section 7 Consultation Technical Assistance website at www.fws.gov/midwest/endangered/section7/sppranges/index.html. July 2010.

WDNR. 2010. Technical Support Document for Wisconsin Phosphorus Water Quality Standards.